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10/615,112	07/08/2003	Thaddeus Schroeder	DP-309799	9110

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EXAMINER	
SCHINDLER, DAVID M	

ART UNIT	PAPER NUMBER
2862	

DATE MAILED: 08/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/615,112	SCHROEDER ET AL.	
	Examiner	Art Unit	
	David Schindler	2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 July 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Bot Ledynh
Primary Examiner

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the features of Claims 7 and 14 with regard to the independent circuits (see the below 112 1st paragraph rejection) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The amendment filed 6/27/2005 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: The title now recites "SENSOR ASSEMBLY AND METHOD FOR INDEPENDENTLY SENSING DIRECTION OF ROTATION AND POSITION OF AN OBJECT." However, the direction of rotation sensed in Figure 6 does appear to depend on the sensed position. Please see the 112 1st paragraph rejection below for further discussion with regard to this matter.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 7 and 14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

It appears that applicant intends to claim the features of Figure 6 by way of

Claims 7 and 14.

Claim 1 now requires "whereby the detection of rotation direction by said first circuit is independent from the detection of position by said second circuit" in the last two lines of the claim. Claim 7 states "a flip-flop coupled to receive an output signal from the single circuit stage and an output signal from the second circuit to trigger a signal indicative of the direction of rotation of the target wheel" on lines 2-4. It appears from this statement, and from Figure 6 along with its respective description (Page 7, Paragraph [023]), that the detection of rotation direction is dependent on the detection of position. The reason for this is that it does not appear from Figure 6 that the direction of rotation can be determined without the detection of position. Therefore, there is a dependency. Claim 14 appears to contain a similar issue.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-3, 6, 8, 9, 10, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Schroeder et al. (herein referred to as "Schroeder") (6,320,374).

As to Claims 1 and 8,

Schroeder discloses the method and apparatus including a target wheel (10), a pair of sensing elements ((26) and (28)) configured to generate respective signals as

the wheel rotates in response to structure on the target wheel ((Figure 2) and (Column 3, Lines 13-23) and (Column 3, Lines 37-43)), a first circuit (30) coupled to receive a signal from at least one of the sensing elements for detecting direction of rotation of the target wheel ((Figure 5) and (Column 4, Lines 51-64)), and a second circuit (Column 5, Lines 6-8) to receive each signal from the sensing elements for detecting position of the target wheel ((see statement below) and (Column 5, Lines 6-8)), wherein the first and second circuits include independent circuits from one another, and is each directly connected to the pair of sensing elements, whereby the detection of rotation direction by the first circuit is independent from the4 detection of position by the second circuit ((Column 4, Lines 32-67) and (Column 5, Lines 1-21)).

It is noted that the Schroeder notes that circuit (80) can be used for outputting the wheel angular position. From Figure 5, this circuit is directly connected to the sensing elements. Any separate circuit used in place of circuit (80) must also then be directly connected to the sensing elements as circuit (80) is in order to perform the same task.

As to Claims 2 and 9,

Schroeder discloses the method and apparatus including the first circuit includes a pair of circuit stages (stage one: (64) in combination with (R) at the top of Figure 5 in combination with (68), stage 2: (66) in combination with (R) at the bottom of Figure 5 in combination with (70)), each of the stages coupled to respectively receive a signal from a respective one of the sensing elements (Figure 5).

As to Claim 3,

Schroeder discloses a flip-flop coupled to receive output signals from the circuit stage pair for detecting direction of rotation to trigger a signal indicative of the direction of rotation of the target wheel ((Figure 5) and (Column 4, Lines 59-64)).

As to Claims 6 and 13,

Schroeder discloses the first circuit includes a single circuit stage (stage one: (64) in combination with (R) at the top of Figure 5 in combination with (68)) coupled to receive a signal from a respective one of the sensing elements (Figure 5).

As to Claim 10,

Schroeder discloses triggering a signal indicative of the direction of rotation of the target wheel in response to a timing relationship between output signals from the circuit stage pair ((Figure 5) and (Column 4, Lines 51-65)).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schroeder et al. (herein referred to as "S1") (6,320,374) in view of Schroeder (herein referred to as "S2") (6,486,657).

As to Claim 4,

S1 discloses as explained above.

S1 further discloses each stage includes a peak detector (Figure 5).

S1 does not disclose each circuit stage for sensing of rotation includes a peak and valley detector.

S2 discloses the use of a peak (PD) and valley (VD) detector in a circuit which receives a signal from a dual MR sensor (200) (Figures 3 and 5).

It would have been obvious to a person of ordinary skill in the art to modify S1 to include each circuit stage for sensing of rotation includes a peak and valley detector given the above disclosure and teaching of S2 in order to determine if the signal exceeds a predetermined maximum or minimum threshold which could indicate potential problems. (see Column 2, Lines 55-68 in S2 about detecting a signal that exceeds a maximum or minimum value).

As to Claim 11,

S1 discloses each stage includes a peak detector (Figure 5).

S1 does not disclose detecting peaks and valleys in the signals received by each circuit stage from a respective one of the sensing elements.

S2 discloses the use of a peak (PD) and valley (VD) detector in a circuit which receives a signal from a dual MR sensor (200) (Figures 3 and 5).

It would have been obvious to a person of ordinary skill in the art to modify S1 to include detecting peaks and valleys in the signals received by each circuit stage from a respective one of the sensing elements given the above disclosure and teaching of S2 in order to determine if the signal exceeds a predetermined maximum or minimum threshold which could indicate potential problems. (see Column 2, Lines 55-68 in S2 about detecting a signal that exceeds a maximum or minimum value).

10. Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schroeder et al. embodiment one (herein referred to as "SE1") (6,320,374) in view of Schroeder et al. embodiment two (herein referred to as "SE2") (6,320,374).

As to Claim 7,

SE1 discloses a flip-flop coupled to receive an output signal from the single circuit stage (Figure 5).

SE1 does not disclose a flip-flop coupled to receive an output signal from the single circuit stage and an output signal from the second circuit to trigger a signal indicative of the direction of rotation of the target wheel.

SE2 discloses a flip-flop (306) coupled to receive an output signal from the single circuit stage ((64) in combination with (68)) and an output signal from the second circuit (304) to trigger a signal indicative of the direction of rotation of the target wheel (Column 5, Lines 44-55).

It would have been obvious to a person of ordinary skill in the art to modify SE1 to include a flip-flop coupled to receive an output signal from the single circuit stage and an output signal from the second circuit to trigger a signal indicative of the direction of rotation of the target wheel as taught by SE2 in order to permit the use of simpler electronics. (see (Column 6, Lines 33-43) about the use of simpler electronics).

As to Claim 14,

SE1 discloses a flip-flop coupled to receive an output signal from the single circuit stage (Figure 5).

SE1 does not disclose triggering a signal indicative of the direction of rotation of the target wheel in response to a timing relationship between an output signal from the single circuit stage and the second circuit.

SE2 discloses triggering a signal indicative of the direction of rotation of the target wheel in response to a timing relationship between an output signal from the single circuit stage ((64) in combination with (68)) and the second circuit (304) (Column 5, Lines 44-55).

It would have been obvious to a person of ordinary skill in the art to modify SE1 to include triggering a signal indicative of the direction of rotation of the target wheel in response to a timing relationship between an output signal from the single circuit stage and the second circuit as taught by SE2 in order to permit the use of simpler electronics. (see (Column 6, Lines 33-43) about the use of simpler electronics).

11. Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schroeder et al. (herein referred to as "Schroeder") (6,320,374) in view of Baker et al. (herein referred to as "Baker") (4,533,902).

As to Claim 5,

Schroeder discloses as explained above.

Schroeder further discloses the use of a zero crossing detector (304) (Column 5, Lines 44-58).

Schroeder does not disclose wherein each circuit stage for sensing direction of rotation includes a zero-crossings detector.

Baker discloses each circuit stage ((circuit stage one is considered to be (10) in combination with (32) and (36)) and (circuit stage two is considered to be (11) in combination with (31) and (35)) includes a zero-crossing detector ((Figure 3A) and (Abstract, Lines 1-17)).

It would have been obvious at the time of the invention to modify Schroeder to include each circuit stage for sensing direction of rotation includes a zero-crossings detector given the above disclosure and teaching of Baker in order to have measurements and calculations that are free of the phase coincidence problem. (see (Column 6, Lines 3-5) and (Column 6, Lines 21-23) which mentions the phase coincidence problem).

As to Claim 12,

Schroeder further discloses the use of a zero crossing detector (304) (Column 5, Lines 44-58).

Schroeder does not disclose detecting zero crossings in the signals received by each circuit stage from a respective one of the sensing elements.

Baker discloses each circuit stage ((circuit stage one is considered to be (10) in combination with (32) and (36)) and (circuit stage two is considered to be (11) in combination with (31) and (35)) includes a zero-crossing detector ((Figure 3A) and (Abstract, Lines 1-17)).

It would have been obvious to a person of ordinary skill in the art to modify Schroeder to include detecting zero crossings in the signals received by each circuit stage from a respective one of the sensing elements given the above disclosure and teaching of Baker in order to have measurements and calculations that are free of the phase coincidence problem. (see (Column 6, Lines 3-5) and (Column 6, Lines 21-23) which mentions the phase coincidence problem).

Response to Arguments

12. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Schindler whose telephone number is (571) 272-2112. The examiner can normally be reached on M-F (8:00 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David Schindler